DOCUMENT RESUME

ED 277 461 PS 016 223

AUTHOR Welbourn, Vivian
TITLE The Effect of Class Composition on Achievement.
PUB DATE 86
NOTE 18p.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *Class Organization; *Classroom Environment; Elementary Education; *Elementary School Students; Literature Reviews; Models; *Student Characteristics
IDENTIFIERS Causal Analysis

ABSTRACT

A review of the literature on the relationship between ability grouping and student achievement reveals that most researchers have found that homogeneous grouping does not significantly affect achievement. A few studies attempted to relate student achievement to teacher ability and instructional strategies; however, they found no significant relationship between the variables. A very limited number of studies tried to assess the relationship of heterogeneous grouping and student achievement. These studies found a significant increase in student achievement in classes in which the heterogeneous groups were also high-aptitude groups. The research in this area has been limited and suggests that more studies ought to be done to investigate the effects of heterogeneous grouping and how student achievement is affected by class aptitude. (RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☒ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Vivian Welbourn

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED277461

PS 016223

THE EFFECT OF CLASS COMPOSITION ON ACHIEVEMENT

Vivian Welbourn

What research says about class composition and student achievement:

The 18th. annual Gallup poll of the public's attitudes toward the public schools indicates that 28% of parents in the nation give the public schools a rating of A or B. The state of Illinois passed the Education Reform Act of 1985 which is designed to provide specific information about schools and districts in a standard format. The report contains statewide averages for most data. This school report card will show parents how their child's school measures up to other schools in their area. Student achievement, one of the important categories of comparison, is measured in the 3rd., 6th., 8th., and 10th. grades.

With the increased emphasis on improving public opinion and the demand for higher achievement scores, schools need to take a closer look at class organization. Many of our schools use; ability grouping, curriculum (or program) tracking, ability grouping for selected

subjects and within-class ability grouping as organizational methods. Relatively little attention has been focused on how the characteristics of students making up classes influence processes or outcomes (Good, 1981). The benefits of having intelligent, verbal peers in classes versus ability grouping on aptitude or prior knowledge needs more research as the trend in education has been to tracking, honor classes and magnet schools. Although a number of studies have been conducted on ability grouping, the results have been contradictory.

The impact of student characteristics on student achievement has received little research attention. When student composition effects have been studied, they have been addressed at the school level rather than at the classroom level. Different methods of organizing classes may be more beneficial for student achievement. The data from this study would be of importance to teachers, school administrators, and school boards.

Centra and Potter(1980) presented a structural model for depicting school and teacher variables which

influence student achievement. The variables were grouped as: (1) school or district conditions, (2) within school conditions, (3) teacher characteristics, (4) teaching behavior, (5) student characteristics, (6) student behavior, and (7) student learning outcomes. They concluded that the effects of any one of the variables on student achievement are likely to be small when compared with the combined interactive effect of all other variables. The variable closest in the chain to student achievement is student behavior. Teacher performance is seen as a substantial contributor to the variance in student behavior, and should be expected to correlate more highly with student behavior than with student achievement.

Student achievement has been studied in different ways, Peterson, Janicki and Swing(1981) did a study to investigate ability x treatment interaction effects on children's learning in a large group approach in which each child worked alone and in a small group approach in which each child worked with other children in mixed ability groupings. The study consisted of classes of fourth and fifth grade students being taught a two week geometry unit by two elementary teachers. They found a

significant aptitude treatment interaction (ATI) for ability. One important finding of the study is the lack of significant main effects for treatment on achievement and retention scores, but a significant treatment effect appeared for students' apttitude toward the teaching approach with the students having a more positive attitude toward the approach in the large group approach than in the small group approach. They also concluded that on the average, students did equally well on the achievement and retention tests in the large group approach as in the small group approach. In this study students initial preferences were used to either match or mismatch them to a teaching approach. Results indicated that matching on students' preferences did not significantly affect their achievement, retention or attitudes.

Student achievement was also studied by Lawrenz and Munch(1984). They grouped students in the laboratory on the basis of their formal reasoning ability. Laboratory groups for three physical science classes for preservice elementary teachers were arranged as follows: (1) one class with students of unequal reasoning ability grouped together,ie. one highly

developed formal reasoner per group (the heterogeneous group), (2) one class with students of similar reasoning ability grouped together (the homogeneous group), and (3) one class arranged in groups according to the desires of the class members (the student choice group). The results showed the groups had significantly different effects on science content achievement. The students in student choice groups had significantly lower scores than the students in the heterogeneous groups or homeogeneous groups. Lawrenz and Munch found that homogeneous and heterogeneous grouped classes did not have significantly different scores.

Slavin(1983),in an effort to colate studies on student achievement and grouping, identified 46 field experiments on cooperative learning in elementary and secondary classes, tried to analyze all the findings. The criterion for the study to be included in his review, (1)had to include a control group (usually with random assignment of classes or students to treatments). (2) Had to have evaluated a cooperative learning method in regular elementary or secondary classes for at least two weeks (more typically 6-12 weeks). Analyzing the data the effects on cooperative

learning methods of student achievement were clearly positive. Of the 46 studies, 29 (63%) showed cooperative learning methods to have significantly positive (or in one case, marginally positive) effects on student achievement. Fifteen (33%) found no differences, and two (4%) found significantly higher achievement for a control group than for a cooperative treatment. However, Slavin went on to conclude that the overall results masked important differences among studies. Difference in achievement outcomes depended on the group study method (group study vs. task specialization) and their use of rewards. Of 27 studies that used group study and group reward for individual learning, 24 (89%) found positive effects on student achievement, while three (11%) found no differences. Contrasting this none of the 9 studies of group study methods that did not use group rewards for individual learning found positive effects on student achievements. Task specialization studies showed less clear results because of the much smaller number of studies. A few of the task specialization studies with group rewards found positive achievement results. Slavin concluded that group rewards and individual rewards increased student achievement and without these

rewards study groups performed no better than control groups. All groups in this study were composed of heterogeneous members and stratified by student, ability, gender and ethnicity.

Contrasting sharply with Slavin was Kulik and Kulik's(1984) study on a meta-analysis of findings from 31 separate studies. They concluded that ability grouping had significant positive effects on the academic performance of elementary school children. The benefits of grouping tended to be small in the typical study of achievement. One subgroup, the high ability, or "gifted" students put into special classes reported effects in achievement that were moderate in size. Meta-analysis also showed that ability grouping had trivially small effects on the self-concepts of elementary school pupils.

Hoge and Butcher(1984) analyzed teacher judgments of pupil achievemens levels. A sample of 12 teachers were asked to provide for each of their pupils an estimate of achievement test performance, a rating of basic intellectual ability and a rating of motivation to do school work. Standardized reading achievement and IQ

tests were administered to pupils. The analysis indicated a very close correspondence between the achievement judgments and the achievement test.

Analysing traditional classroom organization were Rosenholtz and Cohen(1983). In a study on back to basics in the desegrated schools, they attempted to address some of the problems of the traditional classroom organization. They presented evidence that reading ability acts as a status characteristic to depress the performance of those seen as poorer readers. Rosenholtz constructed a special multiple abilities curriculum designed to treat problems of reading ability status in ongoing classrooms. They concluded that teachers must seek alternatives to traditional classroom structure. Three basic changes are required: a change in task structure, change in evaluation procedures, and a change in the kinds of human abilities that students see as relevant to classroom success.

Chavez(1984) did a review on the impact high-inference measures had on studying classroom climates. He reviewed literature from the late 1920's through the

early 1960's. He then reviewed several high-inference measures developed in the last 30 years. Chavez concluded that classroom climate research using high-inference measures did not become prevalent until the mid-sixties. My Class Inventory (MCI) and the Learning Environment Inventory (LEI) developed in the last three decades has established a strong research tradition in the last decade. The predictability of students' cognitive, affective, and behavioral outcomes are related to students' perceptions of pschosocial characteristics in classrooms. He concludes that curriculum evaluation should more often include classroom environment dimension as criterion and predictor variables. In addition, classroom environment information can provide a valuable basis for reflections upon and subsequent improvement of curriculum and classroom practice.

Parkerson, Schiller, Lomax and Walberg(1984) explored the causal models of educational achievement. They evaluated five causal models of educational productivity as they applied to learning science among a sample of 882 fifth-through-eighth grade students. Each model explored the relationship between

achievement and a combination of eight constructs, home environment, peer group, media ability, social environment, time on task, motivation, and instructional strategies. Linear structional-relations(LISREL) analysis was employed to examine each of the models. They used 5 theoretical graphic models to correlate their findings to achievement. Model one assumed that the eight factors were a direct-one way cause of learning. Ability, motivation, quantity and quality of instuction were significant predictors of achievement. Ability was by far the best single predictor, and quality of instruction was the only significant negative predictor. Model two yielded an unacceptable correspondence of fitted and observed correlations. Model three showed home, social environment and media having a significant positive influence on time, motivation, quality of education and ability, which directly relates to achievement, with exception that media was unrelated to ability and social environment had a negative impact on ability. Model four showed motivation, social environment, and quantity of instruction having significant positive predictors of quality. Whereas only the ability factor had a strong

influence on achievement. The fifth model showed each construct to be statistically significant in a positive direction with the exception again of quality of instruction having a negative impact on achievement. They concluded that reciprocal and mediated paths of causal influence rather than purely direct-one-way causation must be taken into account to afford a better understanding of classroom learning.

Recent research has demonstrated that classroom process can be altered in ways that improve student achievement. Beckerman and Good(1981) did a study on the classroom ratio of high-and low aptitude students and its effects on achievement. "More favorable," classrooms were defined as those in which more than a third of the students were high aptitude learners and less than a third of the students were low aptitude. "Less favorable" classrooms were those in which less than a third of the students were high aptitiude and more than a third of the students were low aptitude. Beckerman and Good concluded that both high-and-low aptitude students in more favorable classrooms had greater achievement gains than comparable students in less favorable classrooms.

A teacher's ability to manage the classroom has been consistently associated with pupil achievement and positive pupil attitudes,Evertson(1982). Research has also shown that classes with high proportions of low ability students tend to be more difficult to manage because of the special meeds of these students,(Metz 1978). Evertson's study on differences in instructional activities in higher-and-lower-achieving Junior High English and Math classes offers an opportunity to examine teachers' instructional methods in each two classes which vary widely in student ability. The quantative data revealed lower ability classes, even though they were significantly smaller than higher ability classes, were harder to manage. In lower ability classes, it was harder to obtain and manitain the cooperation of the students and to keep students engaged on academic tasks . Teachers did not tend to differentiate their patterns of instructional activities between the two classes but instead sequenced actvities with few exceptions in essentially the same way. In their comparison of three more and less effective teachers of low ability classes, they suggested that there are optimal ways of providing

instruction for low classes so as to increase productive learning time and elicit and maintain student cooperation.

In an article written for the Smithsonian by Kindly)1985), one room school houses were compared with research done by educators on "peer group teaching" and multi-age grouping." Kindley stated that in a one room school ,peer-teaching and multiage grouping occur naturally, because the teacher is busy part of the time, the children teach each other and that a youngster can work on a higher or lower ability level without the stigma associated with the pressure of being left back or the pressure of being skipped ahead. Of the 80 remaining one room schools according to the National Center for Education Statistics, more than 350 are in Nebraska. Nebraska ranks fourth on standardized achievement tests compared with other states, and Kindley stated "maybe something that served the pioneers might serve us as well today."

The reviewed literature indicated that many studies have been performed on ability grouping and student achievement. Most of the studies concluded that

homeogeneous grouping did not significantly affect achievement. A few studies attempted to relate student achievement to teacher ability and instructional strategies. However, these studies did not find a significant relationship between student achievement and a teacher's ability or instructional techniques.

A very limited number of studies tried to assess the relationship of heterogeneous grouping and student achievement. In the studies of heterogeneous grouping and student achievement a significant increase in student achievement was attributed to classes in which the heterogeneous groups were also high-aptitude groups. The research in this area has been very limited and suggests that many more studies need to be conducted on heterogeneous grouping and how class aptitude affects students' achievement.

BIBLIOGRAPHY

Centra, J.A. and Potter, D.A., "School and Teacher Effects: An International Model", Review of Educational Research 30:273-291 (Summer 1980).

Beckerman, T.M. and Good, T.L., "The Classroom Ratio , High-And-Low Aptitude Students and Its Effects On Achievement", American Educational Journal of Research 18:317-327 (Fall 1981).

Chavez, R.C., "The Use of High-Inference Measures to Study Classroom Climates", Review of Educational Research 54:237-261 (Summer 1984).

Gallup Poll, 18th, Phi Delta Kappan (September 1986)

Evertson, C.M., "Difference In INstuctional Activities in Higher-and-Lower Achieving Junior High English and Math Classes", The Elementary School Journal 82:329-350 (March 1982).

Hoge, R.D. and Butcher, R., "Analysis of Teacher Judgments of Pupil Achievement Levels", Journal Of Educational Pschology 76:771-781 (1984)

Kindley, M.M., "Little Schools on The Prairie Still

Teach a Big Lesson", Smithsonian 16:118-120 (October 1985).

Kulik,C.L. and Kulik,J.A., "Effect of Ability Grouping On Elementary School Pupils: A Meta-Analysis", Paper presented at the Annual Meeting of the American Psychological Association (92nd Toronto, Canada, August 1984).

Lawrenz,F. and Munch, T.W., "The Effect of Grouping of Laboratory Students on Selected Educational Outcomes", The National Association for Research In Science (1984)

Parkerson, Shiller, Lomaz and Walberg, "Exploring Causal Models of Educational Achievement", Journal of Educational Psychology 76:638-646 (1984)

Peterson,P.L., Janicki,T.C. and Swing,S.R., "Ability" x Treatment Interaction Effects on Children's Learning in Large-Group and Small-Group Approaches" American Educational Research Journal 18:453-473 (Winter 1981).

Rosenholtz,S.J. and Cohen,E.G., "Back to Basics and the Desegregated School", The Elementary School Journal 83:515-527 (May 1983).

Slavin, R.E., "Students Motivating Students to Excel: Cooperative Incentives, Cooperative Tasks and Student Achievement", The Elementary School Journal 85:52-63 (September 1984).